MF2900 AP

MediaFlex 2900 Multimedia Access Point User's Guide

Part number: 8000001

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Ruckus Wireless, Inc. does not assume any liability that may occur due to the use or application of the product(s) or circuit layout(s) described herein.

Federal Communications Commission (FCC) Compliance Notice: Radio Frequency Notice

The device has met the FCC 15.247 requirement. In order to comply with the FCC RF exposure requirement, the user must keep 20cm away from the antenna.

This device has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This device generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this device does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Information to the user

The user’s manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user’s authority to operate the equipment. In cases where the manual is provided only in a form other than paper, such as on a computer disk or over the Internet, the information required by this section may be included in the manual in that alternative form, provided the user can reasonably be expected to have the capability to access information in that form.

EN 55 022 Declaration of Conformance

This is to certify that the MediaFlex 2900 Multimedia Access Point is shielded against the generation of radio interference in accordance with the application of Council Directive 89/336/EEC, Article 4a. Conformity is declared by the application of EN 55 022 Class B (CISPR 22).

Contents

Preface

This MediaFlex 2900 Multimedia Access Point User's Guide will help you understand the MediaFlex 2900 Multimedia Access Point, how to install it, and configure it using the Ruckus Wireless Web Interface.

Who Should Use this Guide

This User's Guide assumes that the reader has basic to intermediate computer and Internet skills. All the basic computer networking, Internet, and other information required to configure this device is provided herein.

What You'll Find in this Guide

The following topics are covered:

- Chapter 1: "Introduction"
- Chapter 2: "Installation and Setup"
- Chapter 3: "Using the Ruckus Wireless Web Interface"
- Appendix A: "Technical Specifications"

Typographic conventions

This User's Guide uses the following typographic conventions:

Table 1—Typographic conventions

Typeface or Symbol	Meaning	Example
italics	Emphasis, book titles, CD names, special terms. Also used to denote optional input if surrounded by <*brackets*>	Read your *User's Guide* thoroughly. Enter an address in the range `192.168.0.<2-253>`
bold	System menu names, user input	Open the **Control Panel**.
`fixed`	Screen text, URLs, IP addresses	Browse to the following IP address: `http://192.168.0.1`

System Requirements

The MediaFlex 2900 Multimedia Access Point is compatible with most contemporary personal computers and operating systems that are configured for Internet and wireless networking.

The MF2900 AP is accessed and configured via a Web browser interface. Any of the following Web browsers are supported:

- Microsoft Internet Explorer 5.0 and higher
- Netscape version 6.0 and higher
- Apple Safari 1.0 and higher
- Mozilla Firefox version 1.0 and higher

Support and Warranty Information

See the *Warranty and Support* card for detailed information about contacting Technical Support, and the Warranty terms for your MediaFlex 2900 Multimedia Access Point.

Chapter 1: Introduction

Congratulations on your purchase of the MediaFlex 2900 Multimedia Access Point (MF2900 AP). The MF2900 AP is a device that enables wireless multimedia networking for video, voice and data, without replacing existing routers, network adapters and media receivers.

A typical installation consists of a Ruckus Wireless, Inc. MediaFlex 2900 Multimedia Access Point connected to a DSL router or cable modem. The MF2900 AP sends wireless signals to MediaFlex 2501 Multimedia Wireless Adapter or other adapter that is connected to a set top box. Video, data and voice traffic are distributed amongst TV, video appliances, and other wireless-enabled home entertainment appliances.

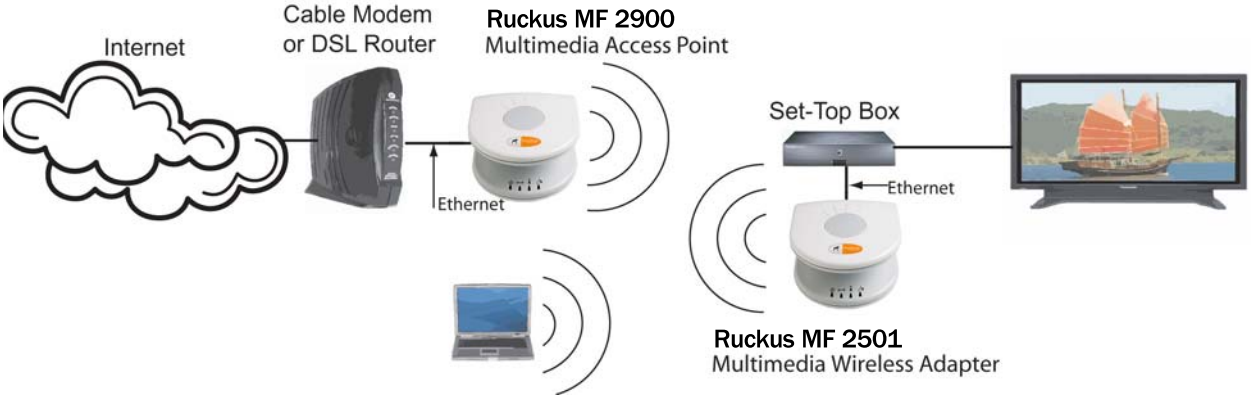

Figure 1—*The MediaFlex 2900 Multimedia Access Point in a Typical Home Network*

MediaFlex™

MediaFlex™ is Ruckus Wireless, Inc.'s family of purpose-built, multimedia WiFi appliances that enable reliable wireless distribution of entertainment-quality, real-time media applications throughout the home. Media applications require consistent and uninterrupted bandwidth; however most wireless LANs (WLANs) cannot provide consistent service because of the variable nature of the wireless medium.

Ruckus Wireless, Inc.'s new, patent-pending Multicast TV-over-WLAN (TVoWLAN) technology differentiates multicast video frames from general multicast and broadcast traffic to provide robust wireless transport for IPTV streams—from the broadband gateway to the set top boxes.

To mitigate the performance impact of concurrent applications and interfering devices in a shared medium network, MediaFlex integrates Video54's new, patent-pending Media Quality of Service (QoS) technology to automatically classify video traffic and prioritize transmissions among applications.

BeamFlex™

BeamFlex™ is Ruckus Wireless, Inc.'s patent-pending antenna technology that allows wireless signals to navigate around interference, extend wireless signal range, and increase speeds and capacity for 802.11b/g wireless networks. The BeamFlex™ antenna system consists of an array of six high-gain directional antenna elements, that allow the MF2900 AP to find quality signal paths in a changing environment, and sustain the baseline performance required for supporting data, audio and video applications.

Key Features

BeamFlex™ Smart MIMO Antenna Maximizes Wireless Range and Performance

- Multi-In, Multi-Out (MIMO) technology supports real time learning of Radio Frequency, station, network and application conditions.
- On-the-fly adaptation to each receiving device in response to environmental changes such as interference to maximize signal quality, data rate and minimize packet errors and retransmissions.
- Internal driver software controls an antenna array with 6 high-gain, directional antenna elements and 63 unique antenna combinations.
- Expert system 802.11 driver controls data rate and retransmission policies on a per-packet basis.

Media QoS Ensures Highest Video Quality

- Automatic traffic classification and Type-of-Service (TOS) tagging eliminates complex QoS configurations.
- Priority queuing for voice, video, best-effort and background traffic, per WiFi Alliance WiFi Multimedia (WMM) specifications.
- Strict priority with short (2 frames) hardware queue depth to ensure rapid feedback from the remote AP.

Multiple Concurrent Video Streams with Simultaneous Data Traffic

- Delivers 15-20 Mbps of bandwidth at 99.9% availability throughout a typical 2500ft^2 (300m^2) home.
- Supports one MPEG-4/WMV stream, one DVD-quality MPEG-2 streams, or one 10Mbps+ high definition video stream at 50ft (18m), with simultaneous data traffic.

Simple Configuration and Installation

- Simple Web-based user interface for easy configuration and customization of features such as SSID, WEP or WPA key, statistics monitoring and software upgrade.

Standards-based Solution Protects User Investment, Minimizes Replacement Cost

- Compliant with 802.11b and 802.11g: supports 802.11g wireless networking at up to 108 Mbps; and can interoperate in 802.11g-only or mixed networks.
- Compliant with 802.1x (WEP and WPA with TKIP) and Wi-Fi Alliance WMM specifications.
- Supports Wi-Fi Protected Access-Pre-Shared Key (WPA-PSK) data encryption. WPA provides strong data encryption and authentication based on a pre-shared key.
- Supports 64-bit and 128-bit WEP encryption security. WEP keys can be generated manually or by passphrase.
- Provides Access Control List (ACL) configuration to restrict wireless access based on MAC address, WEP keys or WPA passphrase.
- Attaches to installed routers or home gateways via Ethernet to optimize the WLAN without replacing existing router, firewall or media devices.
- Forward compatible with the emerging 802.11n WLAN standard.

Chapter 2: Installation and Setup

This chapter describes how to install your MediaFlex 2900 Multimedia Access Point, and how to set up your PC to connect to the Ruckus Wireless Web Interface.

Topics covered in this chapter include:

Packing List

1. MediaFlex 2900 Multimedia Access Point
2. AC power adapter (Input DC 5-18V 1-2A)
3. Category 5 (CAT5) Ethernet Cable
4. *MediaFlex 2900 Multimedia Access Point Quick Setup Guide*

MediaFlex 2900 Multimedia Access Point

Front View

Figure 2— "Front View of theMediaFlex 2900 Multimedia Access Point" shows the front view of the MF2900 AP, with the LED indicators numbered. The numbers correspond to the labels describing LED behavior in Table 2— "LED Indicators and Meanings" on page 13.

Figure 2—*Front View of theMediaFlex 2900 Multimedia Access Point*

LED Status Lights

Table 2— “LED Indicators and Meanings” describes the LED lights on the front of the MF2900 AP.

Table 2—LED Indicators and Meanings

Label	LED	Activity	Description
1	Antenna	All LEDs On Green Solid Counterclockwise flashing Green Flashing randomly	The MF2900 AP is booting. The MF2900 AP is up. The lit LEDs indicate which antennae are active.
2	Power	Green Off	Power is supplied to the MF2900 AP. Power is not supplied to the MF2900 AP.
3	LAN	Green Steady Off	The MF2900 AP has link. The MF2900 AP has no link.
4	Wireless	Green Flashing Green Steady	The MF2900 AP is transmitting data. The faster the flashing, the more data is being transmitted or received. The Wireless port is initialized and enabled.
5	Air Quality	Green Steady Green Flashing Green intermittent Flashing	**Good Air Quality:** A steady Green LED indicates that the current environment will support quality video streaming. **Marginally Acceptable Air Quality:** a flashing Green LED (on for 0.25 second, off 0.25 second) indicates that the current environment does not always meet the video standard. While video streaming is possible, the quality will vary. **Bad Air Quality:** A briefly flashing Green LED (on for 0.03 second and off for 1 second) indicates that video streaming is not possible in the current environment. The brief flash also indicates that the device is still functioning.

Rear View

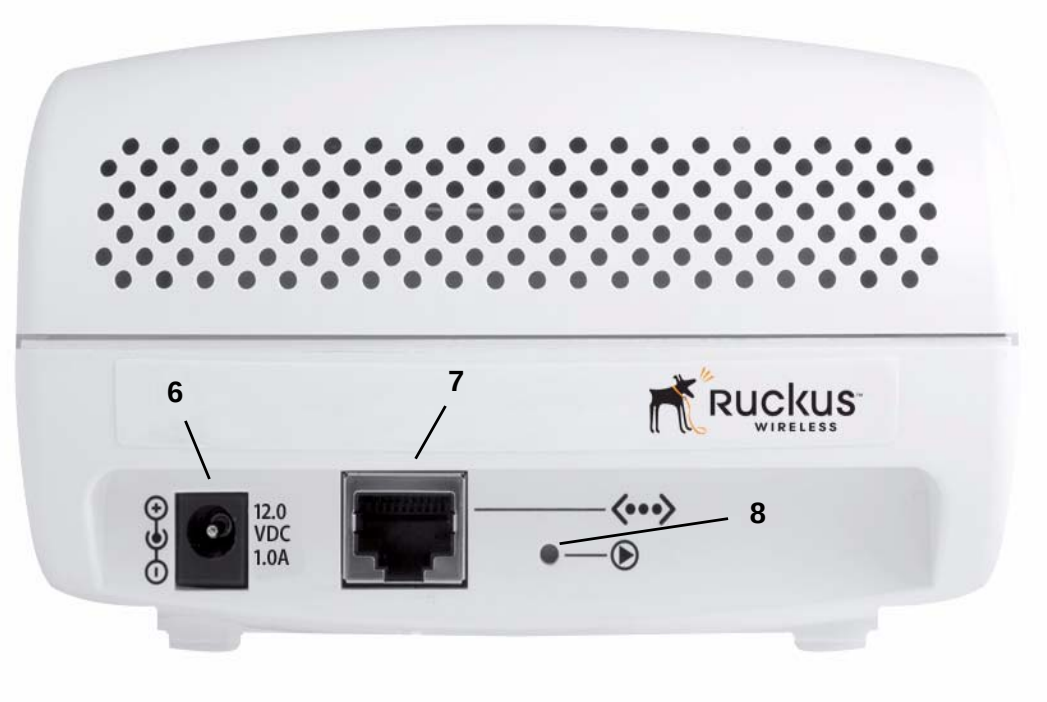

Figure 3—*Rear View of the MF2900 AP*

Table 3—Rear Ports and Adapters

Label	Description
6	AC Power Adapter (Input: DC 5V 2A)
7	10/100 Mbps Auto-sensing, autonegotiating RJ-45 network port
8	Reset button. Used only if you need to reset the MF2900 AP to its factory default settings. Insert the end of a paper clip or pin into the hole and hold it in for at least 4 seconds.

Placement Guidelines

You or your service provider or installer can determine the best placement for the MF2900 AP by using the following guidelines.

Establishing a good general location

Your MF2900 AP should be placed:

- Near the center of the room.
- On a shelf or other elevated location where other wireless networking devices are within line-of-sight access.
- Away from other sources of electromagnetic interference (for example, microwave ovens, and cordless phones).
- Away from large metal surfaces, pictures or mirrors.
- Away from large furniture or other physical obstructions.

Using the Air Quality Indicator to fine-tune the placement

Wireless environments are sensitive to the physical arrangement of both electronic devices and furniture in a room. You or your installer can observe the Air Quality Indicator LED to determine the best location. The Air Quality indicator LED is described in Table 2— “LED Indicators and Meanings” on page 13.

Your service provider or installer can guide you through a self-help troubleshooting session if video quality deteriorates after an installation. Or, you may be able to determine a solution to the problem on your own.

If “Bad” or “Maybe Acceptable,” air quality is indicated, you can adjust the location of the MF2900 AP and other devices until a steady green LED indicates “good” air quality.

Connecting to the MF2900 AP

Before using the MF2900 AP, you have to configure it to work within your home network. Your service provider or installer will likely perform all installation tasks for you, or you may read the following section to understand how to configure it manually.

To gain administrative control of the unit, set your PC or laptop network IP address to an address within the same network as the MF2900 AP’s default IP address. Then, connect your PC to the MF2900 AP using the provided Ethernet cable.

You can set your PC’s IP address to an address within the network **`192.168.0.<2-253>`** (Example: **`192.168.0.100`**).

Manually Configuring an IP Address on Your PC

1. *Windows 2000:* **Start>Settings>Network and Dial-up Connections**
   Windows XP: **Start>Settings>Control Panel>Network Connections**
2. Double-click the icon for the Local Area Connection designated for your home network, then click the **Properties** button at the bottom of the screen. (This is not the same icon as your home wireless network.)

3. In the Local Area Connection Properties window, select Internet Protocol (TCP/IP) and click the **Properties** button. The Internet Protocol (TCP/IP) Properties window appears (Figure 4).

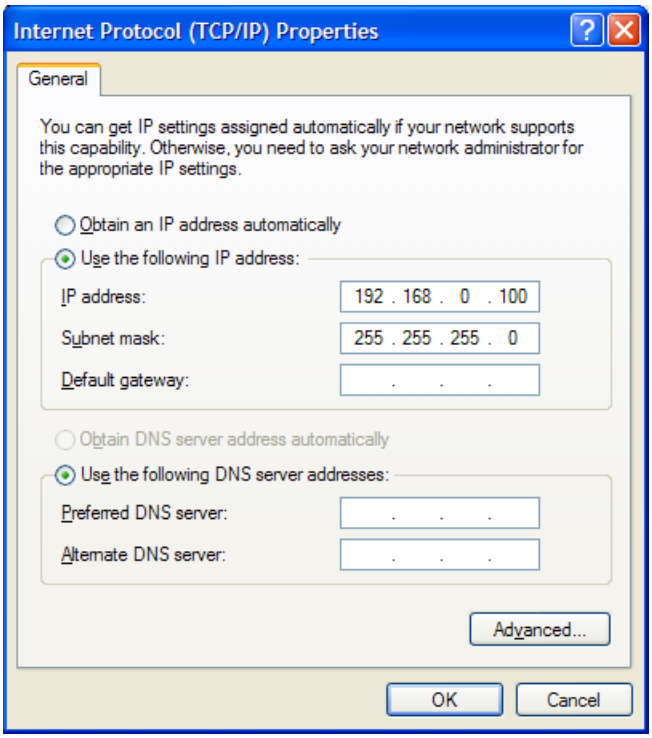

Figure 4—*Internet Protocol (TCP/IP)Properties Window*

4. Select the **Use the following IP address button**, and enter an IP address within the network as noted above.
5. Press **Tab** and allow the Subnet mask address to auto-fill to **255.255.255.0.**
6. Click **OK** to exit the **TCP/IP Properties** window.
7. Click **OK** to exit the **Local Area Connection Properties** window.

Connecting a PC to the MF2900 AP

The following steps will guide you through connecting to your MF2900 AP.

1. Remove the MF2900 AP from the packaging and place it next to your PC or laptop.
2. Connect the AC Power Supply to the MF2900 AP and connect to a power outlet.
3. Connect your PC or laptop to the Ethernet port on the MF2900 AP using the supplied Ethernet cable.
4. On your PC, open a browser window. Enter the address `http://192.168.0.1`.
5. When the login screen appears, enter the username `admin` and leave the password field blank. Then click **Logon**.

CAUTION:—*Make sure to write down the new IP address, username, password and SSID. If you change the MF2900 AP's default IP address to one outside the current address range of your PC, you will not be able to connect to the device after reboot until you reset your computer's IP address to be within the same network as the MF2900 AP. See Table 5, "Wireless Network Settings Worksheet," on page 20 and Table 6, "M2900 AP Default and User Settings Worksheet," on page 21 for more information.*

You should now be able to find the default SSID "V54" of your MF2900 AP over your wireless connection:

Table 4—Default Wireless Settings

Wireless Feature	Setting
Network Name (SSID)	V54
Security	Disabled

Accessing the Web Interface

The MF2900 AP provides a Web-based user interface for configuration and monitoring. For information about using the Ruckus Wireless Web Interface, refer to Chapter 3:, "Using the Ruckus Wireless Web Interface .

1. To access the Ruckus Wireless Web Interface, launch a Web browser and enter the MF2900 AP's IP address. If this is the first time the access point is being configured, enter the default IP address: **http://192.168.0.1**.
2. A logon screen will appear. Use the default logon information:

   Username: **admin**

   Password: <*blank*>

After logging in, you will see the main information page. On the information page, there are two panes. The pane on the left shows major information or configuration points. Each major information or configuration area has a number of sub-menus. Clicking on the relevant menu will bring the relevant page onto the screen.

The system monitors the activities on the Web user interface. If you do not use the Web interface for more than five minutes, the system will time out, and you will be logged out automatically. You need to re-log in to access the interface.

CAUTION:—*Any configuration changes will be lost unless you use the* ***Update*** *button. It is recommended that after each configuration screen you modify, you click the* ***Update*** *button.*

Chapter 3: Using the Ruckus Wireless Web Interface

This chapter describes the tasks you need to do to customize the MF2900 AP to run on your wireless network.

Topics covered in this chapter include:

Wireless Settings Worksheet

Before you modify any wireless settings on the MF2900 AP, print Table 5— "Wireless Network Settings Worksheet" and record the following information about your wireless network. Your ISP or network administrator may provide you with this information. The wireless information recorded in this worksheet should be used to configure the MF2900 AP's wireless settings.

Table 5—Wireless Network Settings Worksheet

Item	Description and Your Network Setting
MF2900 AP SSID	The MF2900 AP will not provide Internet access like a home router or gateway. The SSID identifies the remote AP. Make sure to specify the SSID of the remote AP. You can use up to 32 alphanumeric characters. The SSID *is* case sensitive. After configuration, the MF2900 AP's SSID will become available as a device on your wireless network.
Security	If using WEP, circle the method used: Open SystemShared KeyAuto Circle the type of Shared key: 64-bit 128 bit Passphrase method • If using 64-bit WEP: use 10 hex digits (any combination of **0-9** or **a-f)** or 5 ascii characters • If using 128-bit WEP, use 26 hex digits or 13 ascii characters The WEP key values are *not* case-sensitive. **Key 1** _____ **Key 2** _____ **Key 3** _____ **Key 4** _____
	If using WPA-PSK, write down the passphrase. The WPA-PSK passphrase *is* case-sensitive. **WPA Passphrase:** _____

MF2900 AP Settings Worksheet

Print Table 6, and record your personalized settings for configuring the MF2900 AP. Enter the security settings you recorded in Table 5, “Wireless Network Settings Worksheet,” on page 20.

***Remember**—If the wireless device settings and the* MF2900 AP *do not match, the* MF2900 AP *will not be able to authenticate onto your network.*

Store this information in a safe place.

Table 6—MF2900 AP Default and User Settings Worksheet

Item	Default Setting	Your Setting
User Name	`admin`	_____
Password	*<none>*	_____
IP Address	`192.168.0.1`	_____
Subnet Mask	`255.255.255.0`	_____
SSID	V54	_____
Wireless Mode	802.11g&b	_____
Security	Disabled	_____

Ruckus Wireless Web Interface Menus

The Ruckus Wireless Web Interface menus are located on the left-hand navigation pane. To select a particular menu, simply click on the menu link.

Common Buttons

The Ruckus Wireless Web Interface screens contain the following menu buttons (Table 7):

Table 7—Wireless Web Interface Menu Buttons

Button	Action
Logout	Logs out the current session.
Restore	Restores the original configuration.
Update	Saves the new configuration.
Next	Progresses to the next menu. Only found in the Configuration menus.
Back	Reverts to the previous menu. Only found in the Configuration menus.

Air Quality Indicator

The Air Quality indicator icon shows the current state of your Wireless connection. Air Quality is measured by the Received Signal Strength Indication (RSSI) value, which is a measurement of the wireless signal strength. A high RSSI value usually means that the wireless connection is stable, and quality video data can be transferred.

The Air Quality Indicator assesses the environment that surrounds a Ruckus Wireless, Inc. MF2900 AP, and determines the amount of interference in the infrastructure. The Radio Frequency (RF) side of a wireless device is a combination of a receiver and a transmitter. Both receiver and transmitter provide feedback as they operate. The Air Quality indicator bases its evaluation on the Received Signal Strength Indication (RSSI) that is returned as part of the 802.11 transmission acknowledgement. As the adapter receives an 802.11 packet, it sends the RSSI value to the remote AP.

Thumb Up: Good air quality. The environment supports a quality video viewing experience.

Thumb sideways: Marginal video signal strength. The current environment *may* support video viewing, but it is also possible that the video may be flawed.

Thumb down: Low video signal strength. The current environment does not support quality video viewing.

Configuring the MF2900 AP

This section describes the tasks and screens used to customize the MF2900 AP configuration to run on your wireless network.

Review the following topics before you change any system configuration settings:

- "Connecting to the MF2900 AP" on page 15
- "Accessing the Web Interface" on page 17.

System Configuration

Table 6, “M2900 AP Default and User Settings Worksheet,” on page 21 shows the default settings used to login to the device.

A minimum set of configurations is required to put the MF2900 AP into operational mode. The system provides the default settings for these configuration items. You should change the default settings where necessary to match your own wireless network’s configuration, and to protect your privacy.

A system reboot is required for configuration changes to take effect. Follow the following steps to configure the MF2900 AP:

1. Connect to the M2501 adapter by following the instructions in "Connecting to the MF2900 AP" on page 15.
2. Choose Configuration->System.. The window of Figure 5 appears.

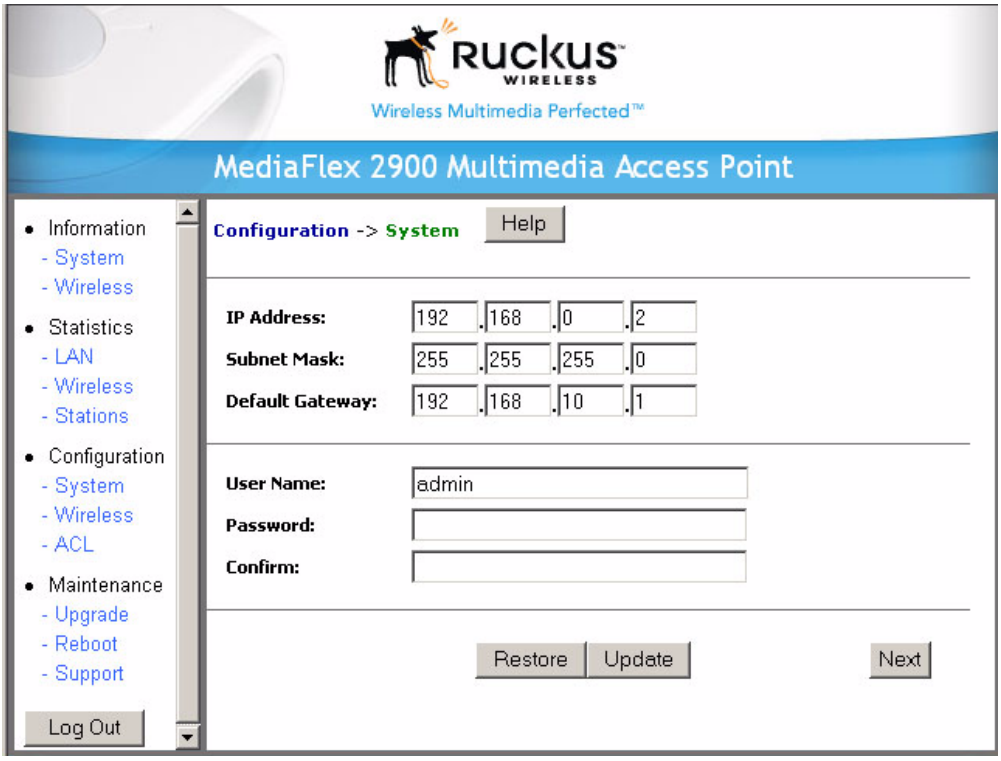

Figure 5—System Configuration

3. Enter your configuration changes in the appropriate fields.

4. Click the **Next** button to go to the next configuration screen.
5. Click the **Update** button to save your settings.

CAUTION:—*You must click the* ***Update*** *button to save any configuration changes. The Ruckus Wireless Web Interface will timeout after 5 minutes of inactivity. If you let the system time out before clicking the* ***Update*** *button, any changes you made will be lost.*

6. Click the **Restore** button to cancel configuration changes.
7. Go to the **Boot** menu and click the **Reboot** button to reboot the device for configuration changes to take effect.

CAUTION:—*If, after having changed any default settings, you have forgotten what the new settings are, you may not be able to login to the MF2900 AP. To regain access to the MF2900 AP, you must reset the device to its factory default settings. Do this by inserting the end of a paper clip into the Reset Button while the unit is on and keep holding the button down until the green LEDs at the top of the unit briefly go out— indicating the system is rebooting.*

Customizing the System Configuration

It is recommended that you customize the username and password so that you can control who can gain administrative access to the MF2900 AP. You may also wish to change the default IP address if it conflicts with another device in your wireless network. Refer to Table 8 for details on each field.

Table 8—System Configuration

Field	Description
IP Address	The IP address of the MF2900 AP. This IP address is used only when you need to access the Ruckus Wireless Web Interface to change configuration or view information about the MF2900 AP.
Subnet Mask	The subnet mask of the MF2900 AP. The default is 255.255.255.0. Changing the Subnet Mask field is not recommended for most installations.
Default Gateway	The IP address of default gateway. The default is 0.0.0.0. If connecting the MF2900 AP to a home gateway, enter the IP of the home gateway into this field. Your service provider or installer may provide this address.
User Name	The user name. The default user name is `admin`. If you change the user name, make sure to write it down for future reference.
Password / Confirm	The user password. The default is no password. If you change the password, make sure to write it down for future reference.

Configuring the Wireless Interface

It is recommended that you consult with your service provider to understand the wireless settings. Before changing any settings in the Wireless configuration menu, make sure you have recorded and verified the information in the following worksheets:

- "Wireless Network Settings Worksheet" on page 20
- "M2900 AP Default and User Settings Worksheet" on page 21.

1. After connecting to the MF2501 Adapter, choose **Configuration->Wireless**. The window of Figure 6 appears.

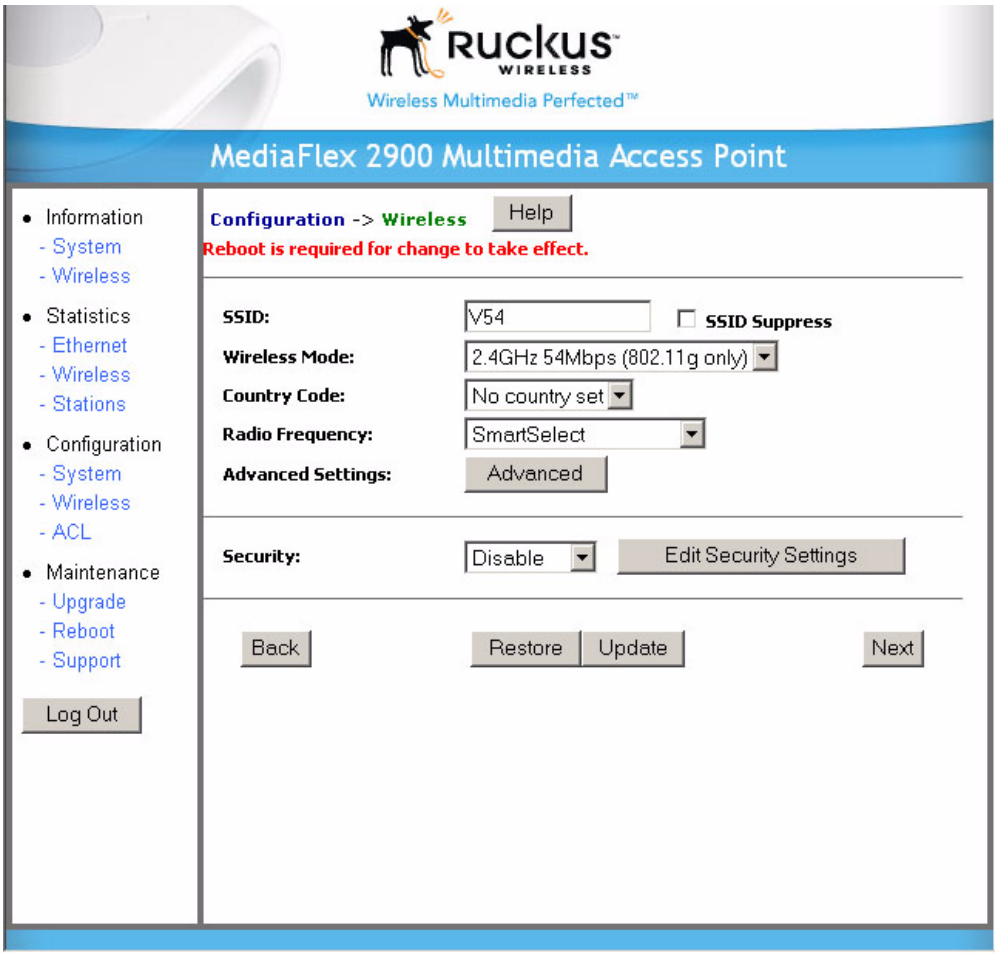

Figure 6—*Wireless Interface Configuration*

2. Fill in the parameters as described in Table 9.

Table 9—Wireless Interface Configuration

Field	Description
SSID	The SSID (Service Set IDentifier) is the name of the wireless network. The default SSID is V54, but it is strongly recommended that you change your SSID. If there are other wireless networks in your area, you should give your wireless network a unique name. The SSID can consist of up to 32 characters.
Wireless mode	The wireless mode options are: • **2.4GHz 54Mbps (802.11g&b)** - allows both 802.11g- and 802.11b-compliant devices to join the network. This is the default setting. • **2.4GHz 11Mbps (802.11b only)** - allow only 802.11b-compliant devices to join the network.
Country Code	Sets your country or region code. Selecting the incorrect country or region may result in violation of applicable law. The selectable countries or regions are United States, Europe, Hong Kong, and Japan. **NOTE –** For MF2900 APs shipped in the United States, the country code cannot be modified. The country code is pre-defined for **United States** only.
Advanced Setting	This button provides access to the advanced wireless settings. Advanced wireless settings are for advanced configuration or testing purposes only. Changing the advanced settings may negatively affect the operation of the MF2900 AP and is *not recommended*.
Security	The wireless security options are: • **Disabled**: This setting disables all encryption, so traffic is sent in the clear. This setting is not recommended. • **WEP**: This setting enables Wired Equivalent Privacy. WEP Shared Key authentication and WEP data encryption provides sufficient security in most cases. • **WPA-PSK:** Wi-Fi Protected Access, Pre-Shared Key (WPA-PSK). Each packet of information is encrypted with a different key. Provides very strong security, but may not be supported on older systems.
Edit Security Setting	Click this button to edit the security setting of WEP keys or the WPA-PSK passphrase.

Advanced Wireless Configuration

The Advanced Wireless Configuration menu is preconfigured with the optimum settings. Changing the advanced settings may negatively affect the MF2900 AP's operation, or completely disable it. For best results, leave the Advanced settings at their default values and do not change these settings unless directed by your technical support personnel.

NOTE – If you have modified the advanced settings and wish to revert to the original settings, you can restore the settings by clicking the **Restore** button, as long as you have not already clicked the **Update** Button.

1. After connecting to the MF2501 Adapter, choose **Configuration->Wireless**. Then click **Advanced**. The window of Figure 7 appears.

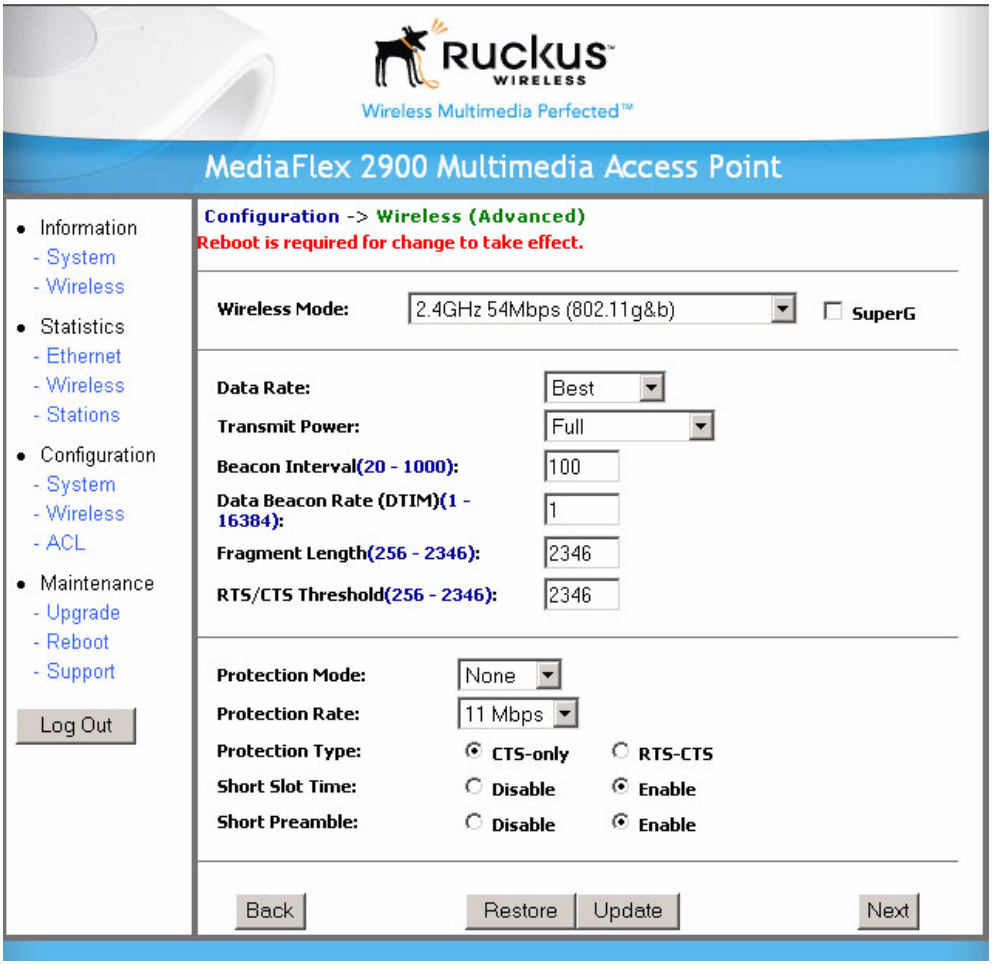

Figure 7—Advanced Wireless Configuration

Table 10 shows the Advanced Wireless Configuration parameters.

Table 10—Advanced Wireless Configuration Parameters

Field	Description
Wireless Mode	Sets the wireless mode for the MF2900 AP. The wireless mode determines the wireless speed of devices that are allowed to associate to the MF2900 AP. Options are: • 2.4GHz 11Mbps (802.11b only) • 802.11g&b: stations running at either 802.11g (2.4GHz, 54Mbps) or 802.11b (2.4GHz 11Mbps) can associate to the MF2900 AP. This is the default setting. • 2.4GHz 54Mbps (802.11g only) • 2.4GHz Auto 108Mbps (802.11g Turbo) • 2.4GHz Only 108Mbps (802.11g Turbo)  ***CAUTION:—****Using Turbo and/or super G mode is NOT supported when running video streams. These modes are intended for diagnostic and for networks where only non-video traffic is transmitted.*
Super G	This check box is used to enable the Super G mode, which engages advanced mechanisms when extra bandwidth is available and or required. By default, this option is not checked.
Data Rate	Select the desired data rate from the drop-down menu. The default is **Best**, which means the system will adjust the data rate automatically.
Transmit Power	Select the desired AP transmit power from the drop-down menu. In cases where you might want to limit your signal coverage range, such as in a small apartment or room, you can select a lower transmit power. The options are: • Full • Half (-3 dB) • Quarter (-6 dB) • Eighth (-9 dB) • Minimum The default is **Full**.

Table 10—Advanced Wireless Configuration Parameters (Continued)

Field	Description
Fragment length	The fragment length. The range is between 256 and 2346 bytes. The default is **2346**. The MF2900 AP uses fragmentation to divide 802.11 frames into smaller fragments which are sent separately to the destination. Only unicast frames can be fragmented. The fragment length can be between 256-2346 bytes. If the data that the MF2900 AP is transmitting is larger than the threshold, it will trigger the fragmentation function. If the packet size is equal to or less than the threshold, the access point will not use fragmentation. In a good wireless environment, the larger the fragment, the more efficient the network operates. In a noisy environment, the fragment length should be adjusted to a smaller size to minimize retransmission and increase the reliability of the transmission.
RTS/CTS Threshold	The RTS-CTS threshold range. The range is between 256 and 2346. The default is **2346**. The RTS-CTS threshold is a value that determines at what frame length the request-to-send/clear-to-send (RTS-CTS) function is triggered. By default, this threshold is set at its highest value. A lower threshold value means that the RTS-CTS function is triggered for smaller frame lengths. A lower threshold may be necessary in environments with excessive signal noise or hidden nodes; but this may result in some performance degradation.

We need to make a glaring warning about not using turbo or super G when using IPTV applications. Something like: Using Turbo and/or super G mode is NOT supported when running video streams, these modes are intended for diagnostic and for networks where only non-video traffic is transmitted.

CAUTION:—*Using Turbo and/or super G mode is NOT supported when running video streams, these modes are intended for diagnostic and for networks where only non-video traffic is transmitted.*

Configuring WEP Security

1. Click **Configuration** ->**Wireless** in the left-hand navigation pane. The window of Figure 6 appears.
2. Select **WEP** in the **Security** drop-down menu.
3. Click the **Edit Security Settings** button.TheWEP Configuration window of Figure 8 appears.

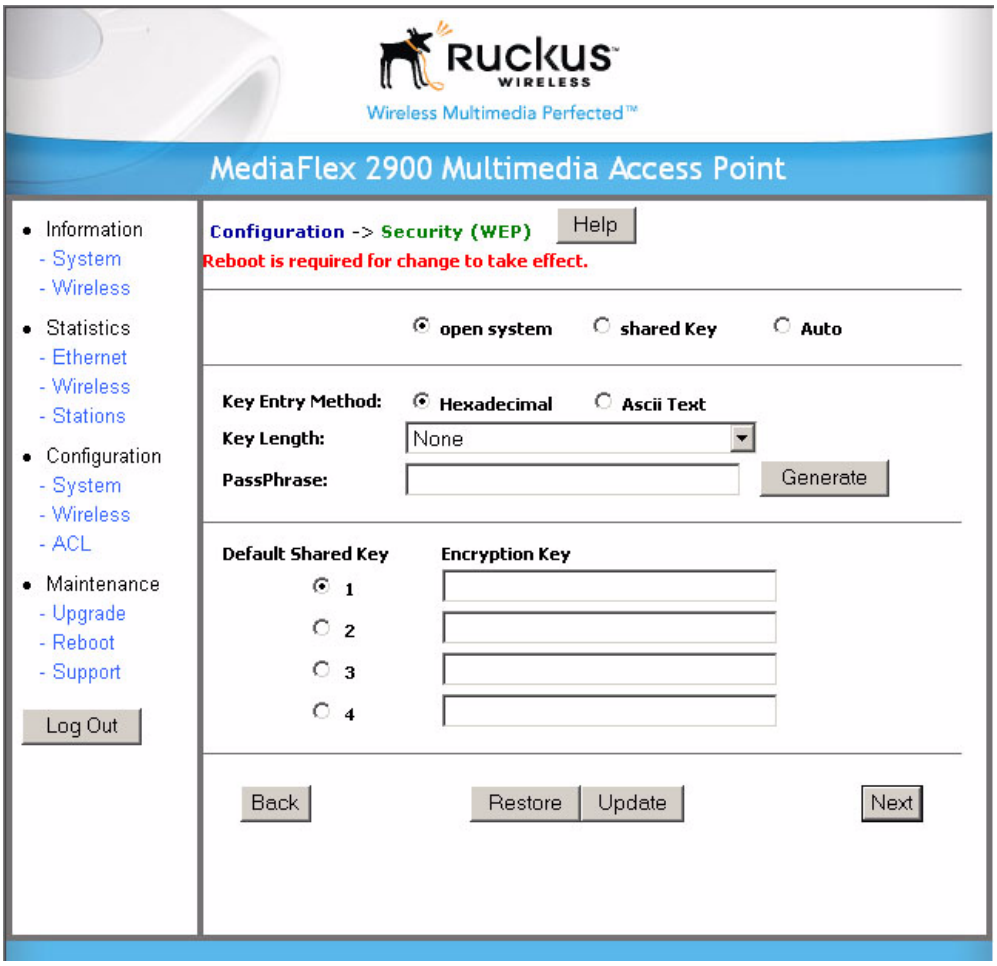

Figure 8—*WEP Configuration Window*

Table 11 explains the WEP Configuration parameters.

Table 11—WEP Configuration

Field	Description
Open System	No authentication is enforced.
Shared Key	Authentication using a shared key. Shared Key authentication encrypts the SSID and data.
Auto	Automatically selects the authentication mode depending on the method used by the station attempting to associate to the MF2900 AP.
Key Entry Method	The key entry method options are: • **Hexadecimal:** Accept entering encryption key with hexadecimal (0-9, A-F). • **Ascii Text:** Accept entering encryption key with ASCII characters.

Table 11—WEP Configuration (Continued)

Key Length	The valid key length options are: • **None**: No key. • **40 bit WEP**: Key with 10 hexadecimal digits or 5 ASCII characters. • **128 bit WEP**: Key with 26 hexadecimal digits or 13 ASCII characters.
PassPhrase	This allows automatic key generation. Enter the desired passphrase and click on the **Generate** button. The system will generate all four WEP keys automatically.
Default Shared Key	The default share key number. There are four shared keys; select one of these keys as the default.
Encryption Keys	These fields auto-fill if you use a passphrase to generate keys. If your network doesn't use Ruckus Wireless, Inc. APs or adapters, enter each key manually according to the **Key Entry Methods** and **Key Length** settings. You may specify up to four different keys and select the desired default shared key.

4. In the **Configuration->Security (WEP)** menu, select **open system**, **shared key**, or **Auto**. See Authentication below for more information.
5. Select the Key Entry Method: **Hexadecimal** or **Ascii Text**.
6. Select the Key length: **40 bit WEP** or **128 bit WEP**.
7. Enter a passphrase and press the Generate button. See Using a Passphrase to Generate Keys below for more information.
8. Click the **Update** button to save your settings.

Authentication

WEP allows three authentication options: **open system**, **shared key**, or **automatic** selection of authentication method.

Under an **open system**, a shared key is not required authentication. However, a shared key must still be used to encrypt and decrypt data between a client adapter and the MF2900 AP.

Shared key authentication adds another layer of security by requiring that a client adapter supply a shared key first to authenticate to the MF2900 AP, and then supply the same shared key for encrypting and decrypting data.

Using a Passphrase to Generate Keys

The MF2900 AP supports automatic generation of four keys from a passphrase.

1. Enter a word or group of printable characters in the Passphrase box and click the Generate button. The passphrase is case sensitive; e.g. **MediaFlex** is not the same as **MEDIAFLEX**. The four key boxes will be automatically populated with key values.
2. Enter the four keys into each client's WEP key configuration:

   The four WEP keys for the MF2900 AP must also be entered on the client adapter in the same order, so that WEP key 1 on the MF2900 AP matches WEP key 1 on the client adapter, WEP key 2 on the AP must match WEP key 2 on the client adapter, and so on.

Once both MF2900 AP and the clients are configured with the same four WEP keys, clients may use any of the four keys for authentication and/or encryption/decryption—and the key used need not be the same key as the MF2900 AP. For example, the MF2900 AP may use key 1, whereas the client may use key 1, 2, 3, or 4.

3. Click the **Update** button to save your settings.

Configuring WPA PSK

WPA PSK configuration menu allows automatic key generation based on a single passphrase. WPA PSK provides very strong security, but may not be supported on older systems.

If you configure the MF2900 AP with WPA-PSK, the other devices in the network will not connect unless they, too are set to WPA-PSK, and are configured with the same passphrase.

1. Click the **Configuration -> Wireless** link in the left-hand navigation pane (Figure 6).
2. Select **WPA-PSK** in the **Security** drop-down menu.
3. Click the **Edit Security Settings** button.The WPA Configuration appears (Figure 9).

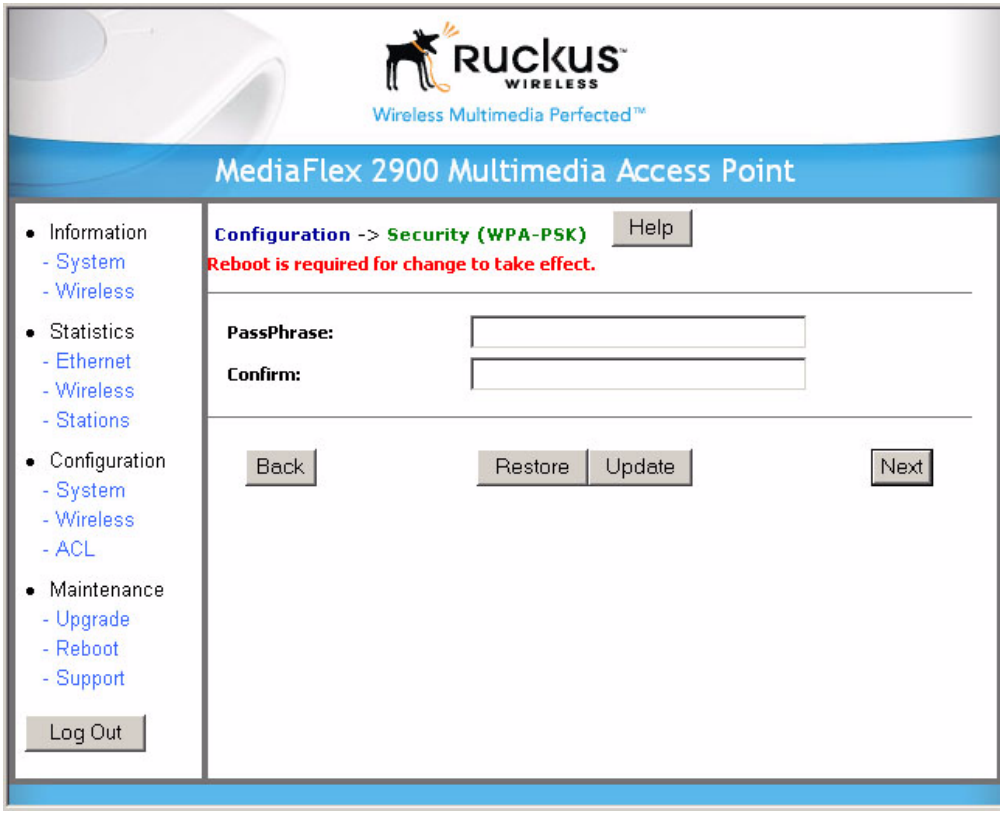

Figure 9—WPA Configuration

Table 12 explains the WPA Configuration parameters

Table 12—WPA Configuration

Field	Description
PassPhrase / Confirm	Enter a passphrase and enter it again in the **Confirm** field.

4. In the **Configuration ->Security (WPA-PSK)** menu, enter a passphrase and enter it again in the **Confirm** field.
5. Click the **Update** button to save your settings.

Configuring an Access Control List

An access control list (ACL) allows you to determine which wireless devices can access the MF2900 AP. You can add only known and trusted computers on your network, and prevent unknown computers from gaining wireless access to the MF2900 AP.

1. To find devices, perform a site survey from your home gateway, router or firewall and find the machine (MAC) addresses of wireless adapters on your network. Any devices you wish to add must be configured with the same wireless and security features as the MF2900 AP.
2. Click on the **Configuration->ACL** link in the left navigation pane to access the ACL menu. This screen will show the Media Access Control (MAC) address of any wireless device that is currently in the ACL. The default list is empty (Figure 10).

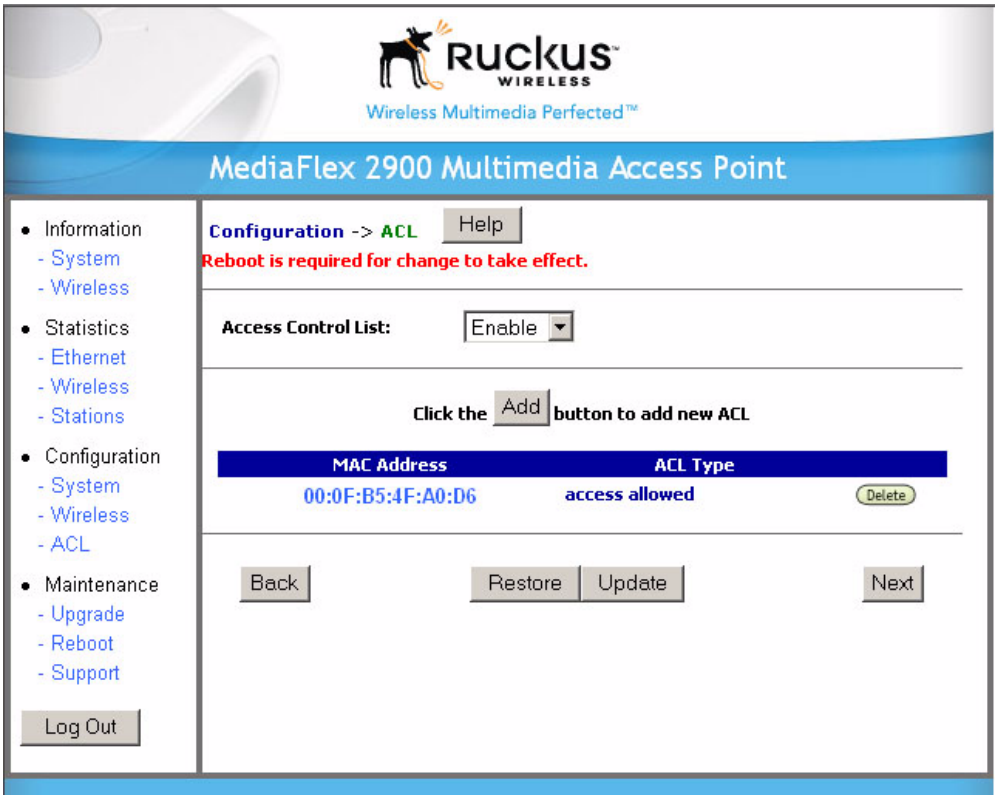

Figure 10—*Access Control List Configuration*

3. Select either **Enable** or **Strict** from the pull-down list. For more information about these options, see Table 14— “ACL Entry Configuration” on page 37.

Adding an ACL entry

1. To add a new entry, click the **Add** button in Figure 10. The New ACL Entry Configuration window appears (Figure 11).

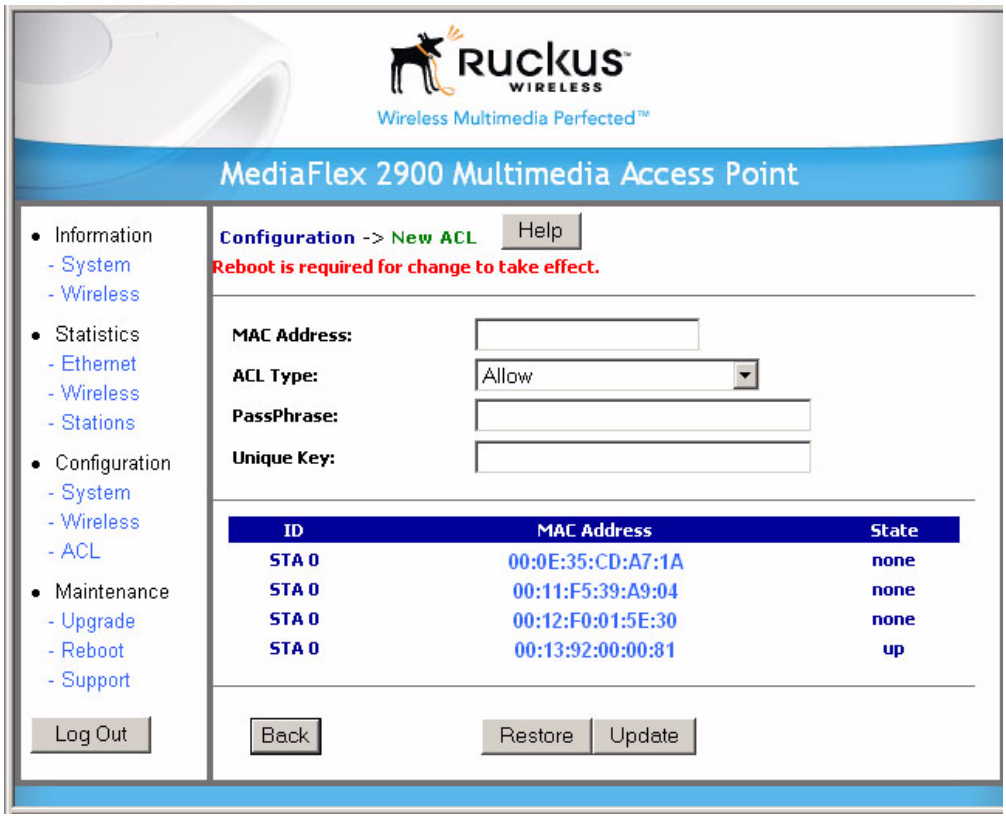

Figure 11—*New ACL Entry Configuration Window*

2. In the New ACL menu, enter a MAC address of the wireless device you wish to add to the ACL.
3. Select the Access Control List type: **Enable**, **Disable**, or **Strict**. To modify an existing ACL entry, click on the MAC Address field..

NOTE – The main difference between **Enable** and **Strict** is that **Strict** requires a unique rather than a shared key. The Unique Key is entered in the Unique Key field of Figure 11.

By default, when the checking of the ACL is enabled, the ACL itself is empty. This is equivalent to disabling checking on the ACL. An ACL entry must therefore exist before enabling ACL. When an ACL is enabled, both stations with valid share keys and stations with matching “allow” entries on the ACL are authenticated.

Alternatively, by choosing **Strict**, you can configure the checking of the ACL to require an assigned unique key, or the station is denied association. In strict mode, stations with valid share keys that are not on the ACL are not authenticated. The stations must have unique keys defined and matching “allow” ACL entries specified to associate to the AP.

Deleting an ACL entry

1. To delete an ACL entry, return to the **ACL** menu (Figure 10).
2. Click the **Delete** button next to the ACL entry you wish to delete.

Table 14 shows the ACL Entry Configuration Parameters.

Table 14—ACL Entry Configuration

MAC Address	The MAC address of the wireless station.
ACL Type	The ACL Type options are: • **Allow:** Allow a station to associate. This is the default setting. • **Deny:** Reject a station from associating. • **Default Shared Key:** Allow a station to associate if their WEP key matches. • **64 bit (enter 10 digits):** Allow a station to associate if their 64 bit key (entered as digits) matches. • **128 bit (enter 26 digits):** Allow a station to associate if their 128 bit key (entered as digits) matches. • **64 bit (enter 5 ascii keys):** Allow a station to associate if their 64 bit key (entered as 5 ascii keys) matches. • **128 bit (enter 13 ascii keys):** Allow a station to associate if their 128 bit key (entered as 13 ascii keys) matches.
Pass Phrase	Sets the passphrase for automatic key generation. This is equivalent to the WPA-PSK passphrase, or the WEP passphrase. You can configure the MAC address to have access to the MF2900 AP only if they use this passphrase.
Unique Key	The unique key to the specific station. The unique key is defined per MAC address. If defined here, you must tell the client to use this key to access the MF2900 AP. The unique key must be entered depending on the ACL type selected above.

Viewing System Information

The Information Screens provide information the MF2900 AP settings.

System Information

The System Information screen is the first screen to appear once you login to the MF2900 AP Figure 12 shows the System Information window.

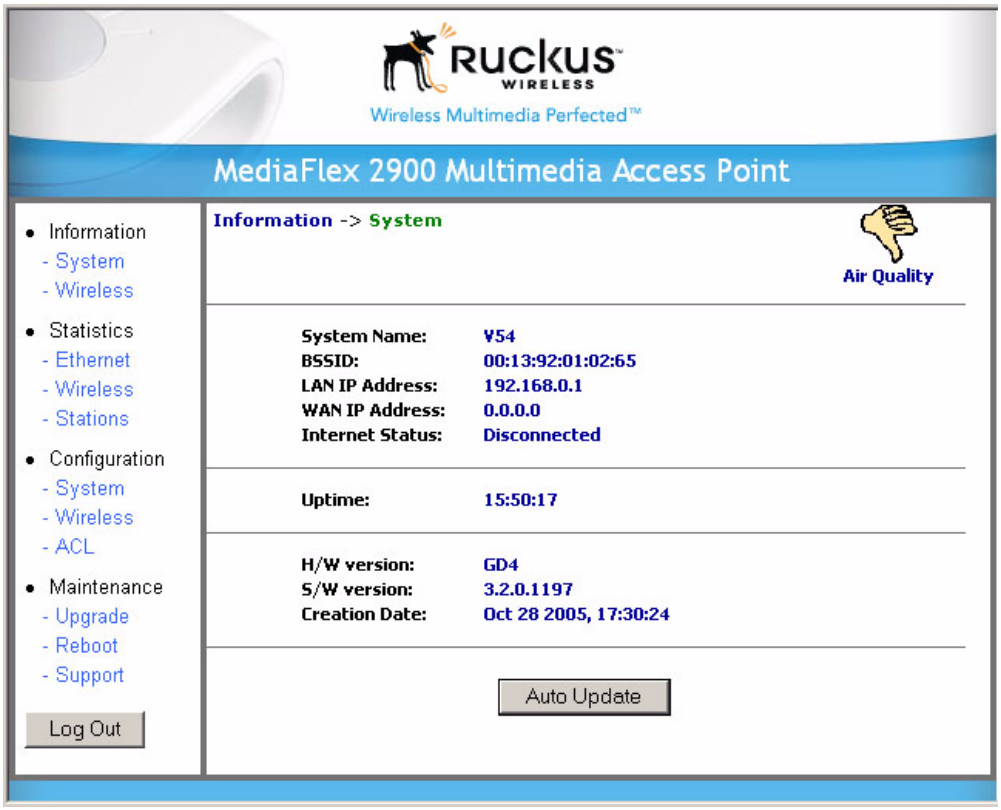

Figure 12—*System Information Window*

Table 15 explains the System Information Parameters.

Table 15—System Information Parameters

Field	Description
System Name	The local name for the MF2900 AP.
MAC Address	The MAC address of the MF2900 AP, or the station behind the adapter.
IP Address	The IP address of the MF2900 AP.
Uptime	The system uptime since last reboot, displayed in HH:MM:SS (hours, minutes, seconds).
H/W Version	The hardware revision.
S/W Version	The firmware version that is currently operating.
Creation Date	The date/time that the firmware was created.

Viewing Wireless Information

The Wireless information menu shows the current wireless configurations for the MF2900 AP. To view this window, click **Information->Wireless** from any window. Figure 13 shows the Wireless Information Window.

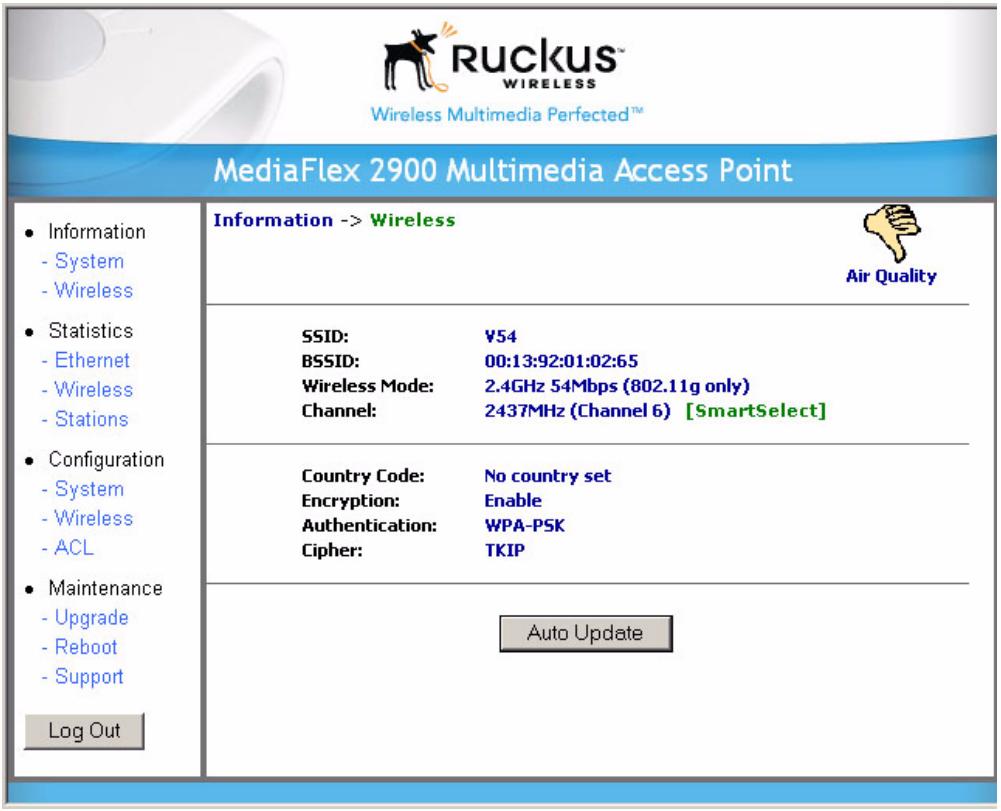

Figure 13—*Wireless Information Window*

Table 16 shows the Wireless Information Window parameters.

Table 16—Wireless Information Window Parameters

Field	Description
SSID	The SSID (Service Set Identifier) is the name of the wireless network.
BSSID	The BSSID is the MAC address of the MF2900 AP.
Wireless Mode	The wireless mode, such as **2.4 GHz 54Mbps (802.11b/g)**
Channel	The wireless channel number and operating frequency in MHz.

Table 16—Wireless Information Window Parameters

Field	Description
Country code	The country in which the MF2900 AP is operating.The country code will automatically select the Channels available for that country.
Encryption	Describes the encryption type currently in use. The encryption types are WEP, WPA-PSK, or disabled. For more information about each type of encryption, see Table 9— “Wireless Interface Configuration” on page 27.

Viewing Statistics

The Statistics Screens provide statistics for a Local Area Network (LAN) interface, the wireless interface and wireless stations.

Viewing LAN Interface Statistics

The LAN Interface statistics windows show information about packets traversing the LAN connected to the MF2900 AP. To view the LAN interface statistics, choose **Statistics->LAN** from any window. Figure 14 shows the LAN Statistics Window.

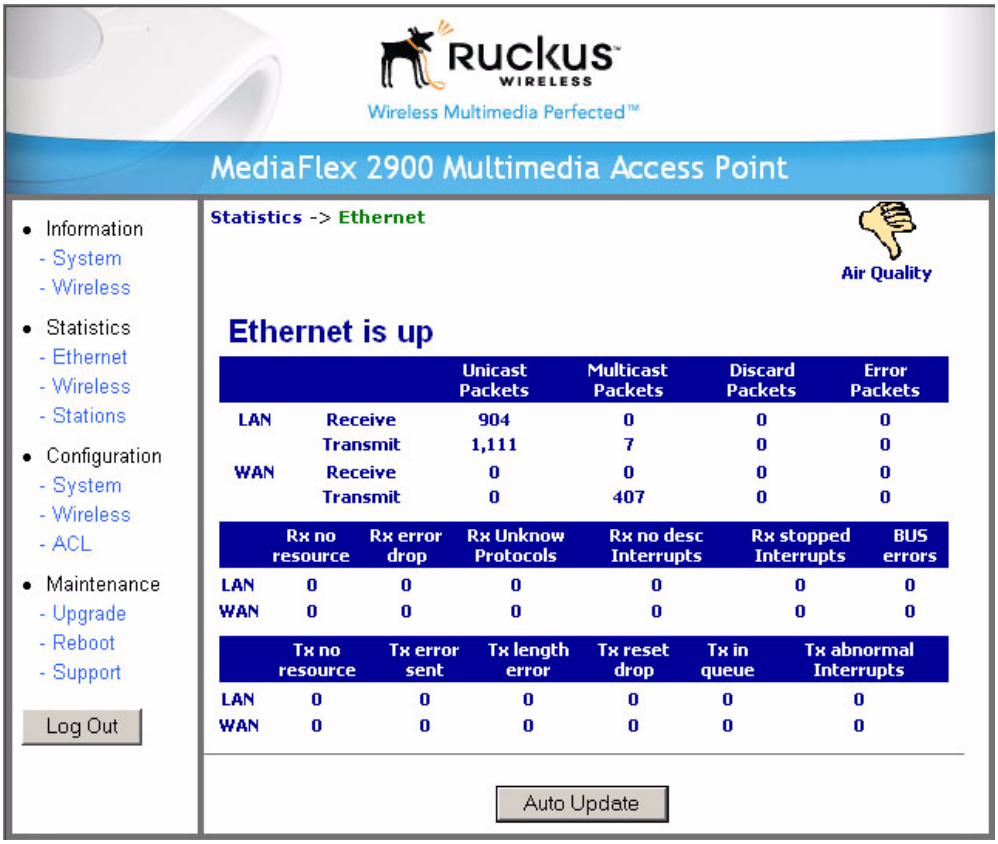

Figure 14—LAN Statistics Window

Table 17 explains the LAN Statistics window parameters.

Table 17—LAN Statistics Window Parameters

Field	Description
Unicast Packets	The total number of unicast packets received or transmitted by the interface.
Multicast Packets	The total number of multicast packets received or transmitted by the interface.
Discard Packets	The total number of received packets that were discarded by the interface.
Error Packets	The total number of error packets received or transmitted by the interface.
Rx No Resource	The number of received packets that are discarded by the interface due to no system resources.
Rx Error Drop	The number of received packets that are discarded by the interface due to a hardware error.
Rx Unknown Protocols	The number of received packets that are discarded by the interface due to an unknown protocol.
RX No Desc Interrupts	The number of received packets that are discarded by the interface due to no descriptor interrupt.
RX Stopped Interrupts	The number of received packets that are discarded by the interface due to stopped interrupts.
BUS Error	The number of received packets that are discarded by the interface due to a BUS error.

Viewing Wireless Statistics

The Wireless statistics menu shows the link, traffic, and security settings for the MF2900 AP. To view this menu, choose **Statistics-Wireless** from any window. The Wireless Statistics Window of Figure 15 appears. At the top of this menu, the AP will display as either **up** or **down**.

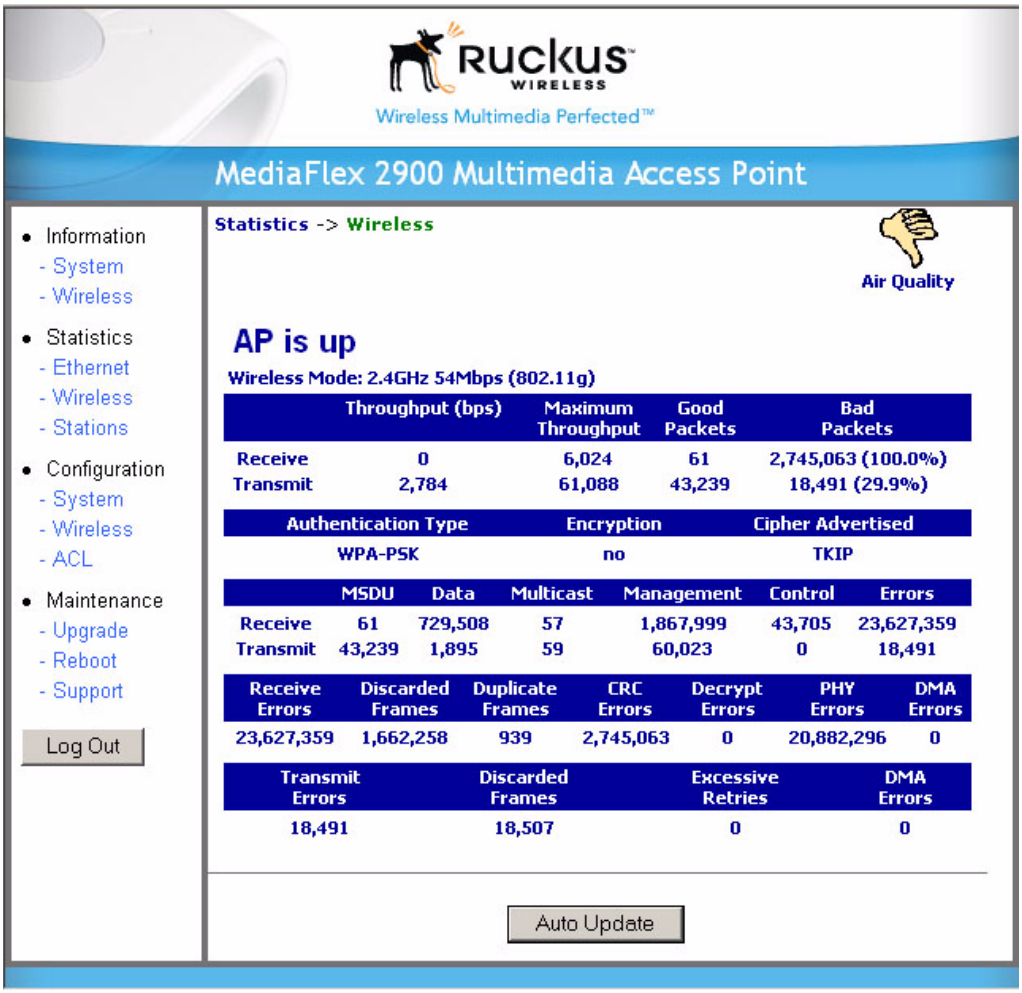

Figure 15—*Wireless Statistics*

1. Click the **Auto Update** button to receive periodic updates to these statistics. The button will then display as **Stop Update**.
2. Click the **Stop Update** button if you do not wish to receive periodic updates.

Table 18 shows the Wireless Statistics parameters.

Table 18—Wireless Statistics

Field	Description
Throughput (bps)	The average receive or transmit throughput in bits-per-second.
Maximum Throughput	The high water mark receive or transmit throughput in bits-per-second.
Good Packets	The total number of good packets received or transmitted by the interface.
Bad Packets	The total number of good packets received or transmitted by the interface.

Table 18—Wireless Statistics (Continued)

Field	Description
Authentication Type	The authentication type configured on the MF2900 AP.
Encryption	The state of encryption configured on the MF2900 AP.
Unicast Cipher	The type of unicast cipher used.
Multicast Cipher	The type of multicast cipher used.
Power Save	The state of power save mode: **on** or **off**.
MSDU	The number of MSDU (Mag Service Data Unit) received or transmitted by the interface.
Data	The number of data packets received or transmitted by the interface.
Multicast	The number of multicast packets received or transmitted by the interface.
Management	The number of management packets received or transmitted by the interface.
Control	The number of control packets received or transmitted by the interface.
Errors	The total number of error packets received or transmitted by the interface.
Signal Strength (RSSI)	The RSSI value received or transmitted by the interface.
Data Rate (Mbps)	The data rate in Mbps received or transmitted by the interface.
Receive Errors	The total number of error packets received by the interface.
Discarded Frames	The number of received or transmitted packets that were discarded by the interface.
Duplicate Frames	The number of duplicate packets received or transmitted by the interface.
CRC Errors	The number of packets with CRC error received or transmitted by the interface.
Decrypt Errors	The number of packets with decryption error received or transmitted by the interface.
PHY Errors	The number of packets with PHY error received or transmitted by the interface.
DMA Errors	The number of packets with DMA error received or transmitted by the interface.
Transmit Errors	The total number of error packets transmitted by the interface.
Discarded Frames	The total number of frames discarded by the interface

Table 18—Wireless Statistics (Continued)

Field	Description
Excessive Retries	The total number of retries that exceed the predefined threshold.
DMA Errors	The number of packets with DMA error received or transmitted by the interface.

Viewing the Station List

The station list shows any wirelessdevice that is associated with the MF2900 AP. When you first configure the MF2900 AP, this list will be blank. once the MF2900 AP is connected to your wireless network, all other wireless devices on the same network will be allowed access to the MF2900 AP. To control which stations can access the MF2900 AP, you can implement an access control list. See “Adding an ACL entry” on page 35 for more information.

To access the station list, choose **Statistics->Station List**. The window of Figure 16 appears.

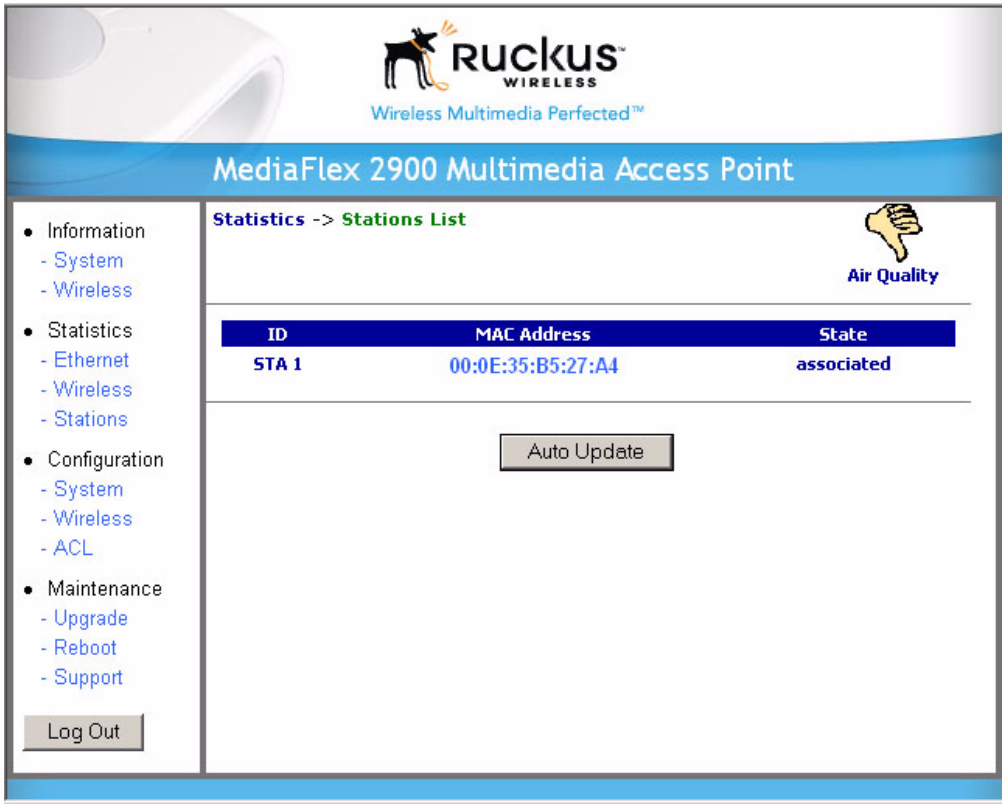

Figure 16—*Station List*

Table 19 shows the Station List parameters.

Table 19—Station List

Field	Description
Station ID	The station ID. This is the name assigned to the PC or device.
MAC Address	The MAC address of the station
State	The state of the station

Viewing Station Statistics

The stations statistics menu shows statistics specific to a station that has associated to the MF2900 AP. To view the station statistics window, choose Statistics->Stations. The window of Figure 17 appears.

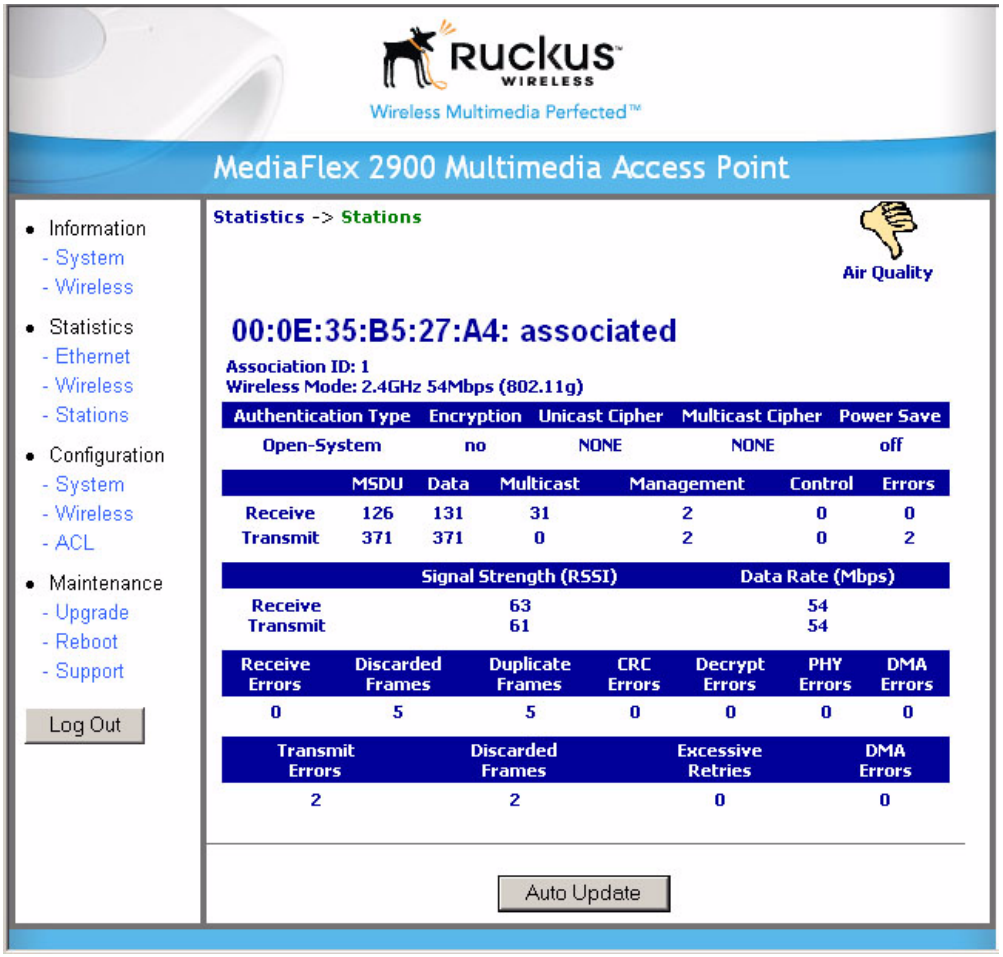

Figure 17—Station Statistics

Table 20 shows the Station Statistics parameters.

Table 20—Station Statistics

Field	Description
Authentication Type	The authenticatio type used by the selected station
Encryption	The state of encryption used by the selected station.
Unicast Cipher	The state of encryption for unicast traffic
Multicast Cipher	The state of encryption for multicast traffic
Power Save	The state of power save mode: **on** or **off**.
MSDU	The number of MSDUs (Mag Service Data Units) received or transmitted by the station.
Data	The number of data packets received or transmitted by the station.
Management	The number of management packets received or transmitted by the station.
Controls	The number of control packets received or transmitted by the station.
Errors	The total number of error packets received or transmitted by the station.
Signal Strength (RSSI)	The Receive Signal Strength Indicator (RSSI) on receive or transmit.
Data Rate (Mbps)	The current receive or transmit phy rate.
Receive Errors	The total number of error packets received or transmitted by the station.
Discarded Frames	The number of received or transmitted packets that were discarded by the station.
Duplicate Frames	The number of duplicate packets received or transmitted by the station.
CRC Errors	The number of packets with CRC errors received or transmitted by the station.
Decrypt Errors	The number of packets with decryption errors received or transmitted by the station.
Phy Errors	The number of packets with PHY errors received or transmitted by the station.
DMA Errors	The number of packets with DMA errors received or transmitted by the station.

Updating the Firmware

This menu provides a utility for updating the MF2900 AP's firmware. A firmware update may be necessary or desirable to add new features, important fixes or enhancements to the MF2900 AP.

Contact your service provider for more information about Web sites or TFTP/FTP sites used to store firmware images for the MF2900 AP.

CAUTION:—*If you have recently made configuration changes to the MF2900 AP, make sure to reboot the system (see "Rebooting the System" on page 49) first so that your changes are preserved. Then update the firmware.*

Performing a Web Download

To download a firmware image from a Web site and use it to update the firmware on the MF2900 AP:

1. Point your browser to the Web site where the MF2900 AP's firmware is stored, and download the firmware image to a folder on your hard drive. Note the location of the downloaded image.
2. In the Ruckus Wireless Web Interface, click the **Maintenance->Upgrade** menu. The window of Figure 18 appears.

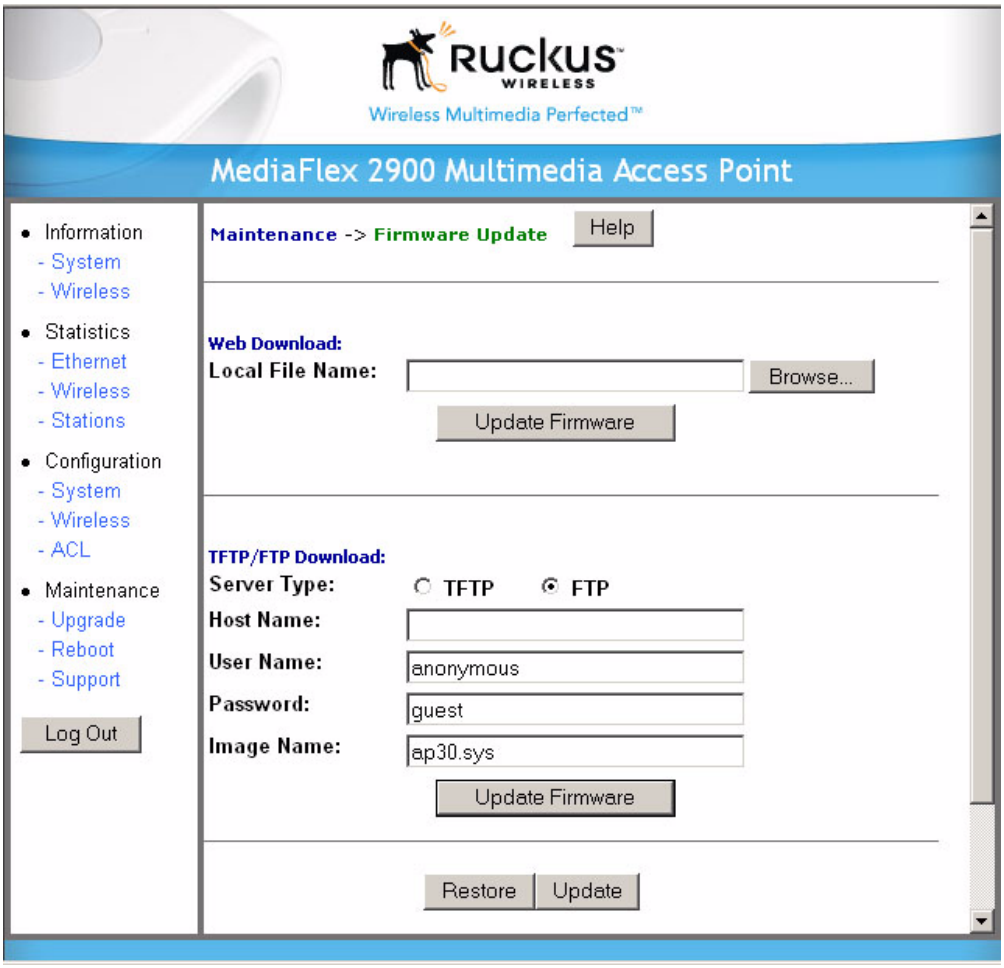

Figure 18—*Updating the Firmware*

Table 21 describes the Updating the Firmware parameters.

Table 21—Updating the Firmware

Field	Description
Web Download	If you have downloaded a Firmware image from a Web site and stored it locally on your PC, you can click the **Browse...** button to select the image. The path to the image will appear in the **Local File Name:** field. Click the **Update Firmware** button located below **Local File Name** field.
TFTP/FTP Download	Allows you to use a TFTP or FTP server to download a firmware image. • **Host Name:** enter the IP address of the server. • **User Name:** enter the User Name that is used to access to the specified server. This is required only for an FTP server • **Password:** enter the Password that is used to access to the specified server. This is required only for an FTP server. • **Image Name:** enter the filename of the firmware image on the TFTP or FTP server. Click the **Update Firmware** button located below **Image Name** field.

3. Click the **Browse...** button to locate and select the firmware image.
4. Click the **Update Firmware** button to perform the update.
5. If the firmware has updated successfully, a green check mark will appear. Click the **Reboot** button.
6. If the firmware did not update, a **Failed: file type** error message will appear.

   A file type error indicates that the firmware image may be corrupt or invalid. Try downloading the firmware image again, and repeat the above steps.

TFTP or FTP Download

To specify a specific trivial file transfer protocol (TFTP) or File Transfer Protocol (FTP) server from which to download a firmware image:

1. Choose the download method by selecting either the **TFTP** or **FTP** button.
2. Enter the IP address or Hostname of the server.
3. For FTP only: Enter the **User Name** and **Password** for the server.
4. Enter the name of the firmware image.
5. Click the **Update Firmware** button at the bottom of the screen to perform the upgrade.
6. If the firmware has updated successfully, a green check mark will appear. Click the **Reboot** button.
7. If the firmware did not update, a **Failed: file type** error message will appear.

   A file type error indicates that the firmware image may be corrupt or invalid. Check the TFTP/FTP server address and the firmware image name. Then try downloading the firmware image again, and repeat the above steps.

Rebooting the System

You must reboot the system if you want your configuration changes to take effect.Two types of reboot are provided:

The **Reboot** button re-starts the system. All the configurations that have been saved are preserved through the reboot. Rebooting is necessary in order to make your configuration changes permanent.

- If the system times out and you have to re-login before setting the reboot, you configuration changes will be saved, **as long as you have already clicked the Update button to save the current configuration.**
- If you have powered down or logged out of the MF2900 AP before clicking the **Update** button and the **Reboot** button, your configuration changes will be lost.

The **Reboot to Factory Default** button restarts the system with the factory default configurations. All previous configurations will be lost.

1. To reboot for either type, click **Maintenance->Reboot** from any window. The window of Figure 19 appears.

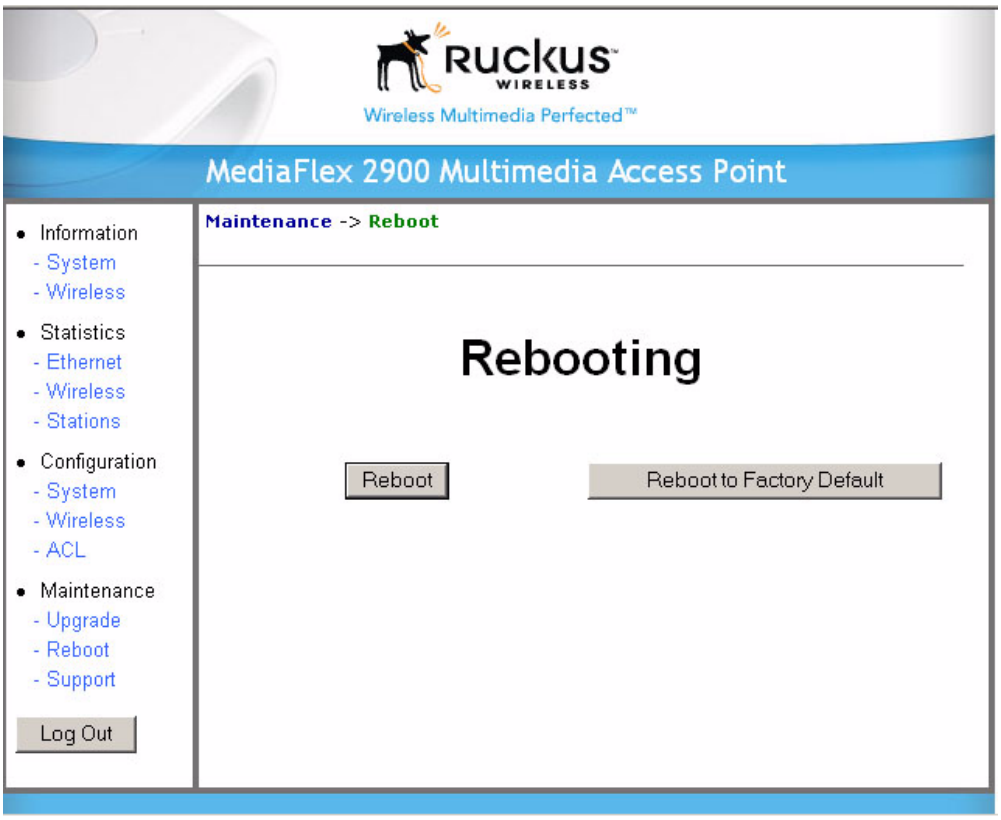

Figure 19—Reboot Menu

2. Click the reboot option you want. The window of Figure 20 appears.

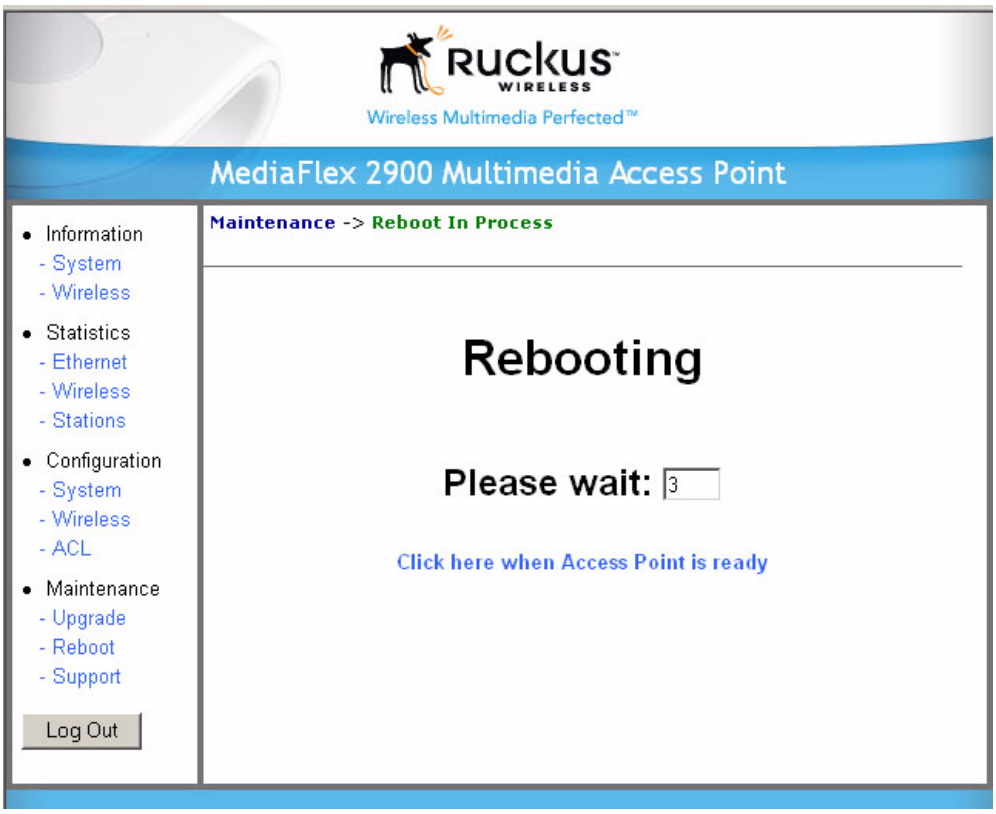

***Figure 20—**Reboot in Process*

During a reboot, the antenna LEDs on the top of the MF2900 AP will momentarily go out, then light up again.

How to tell when the Access point is ready?

After about 18 seconds, the antenna LEDs will start flashing in a clockwise pattern, indicating the MF2900 AP is ready. The **Click here when Access Point is ready** link will open the main login page.

NOTE – If you have modified the device IP address, and then rebooted the device to factory default configuration, the above link will not work. Instead, click the **Logout** button, and then point your browser to the default IP address for the device.

Taking a System Support Snapshot

The Support menu enables you to take a system snapshot for further analysis and troubleshooting. The system snapshot can be sent and saved to a TFTP or FTP server for analysis by a technical support engineer.

1. To view the support menu, choose Maintenance->Support from any window. The Support Menu appears (Figure 21).

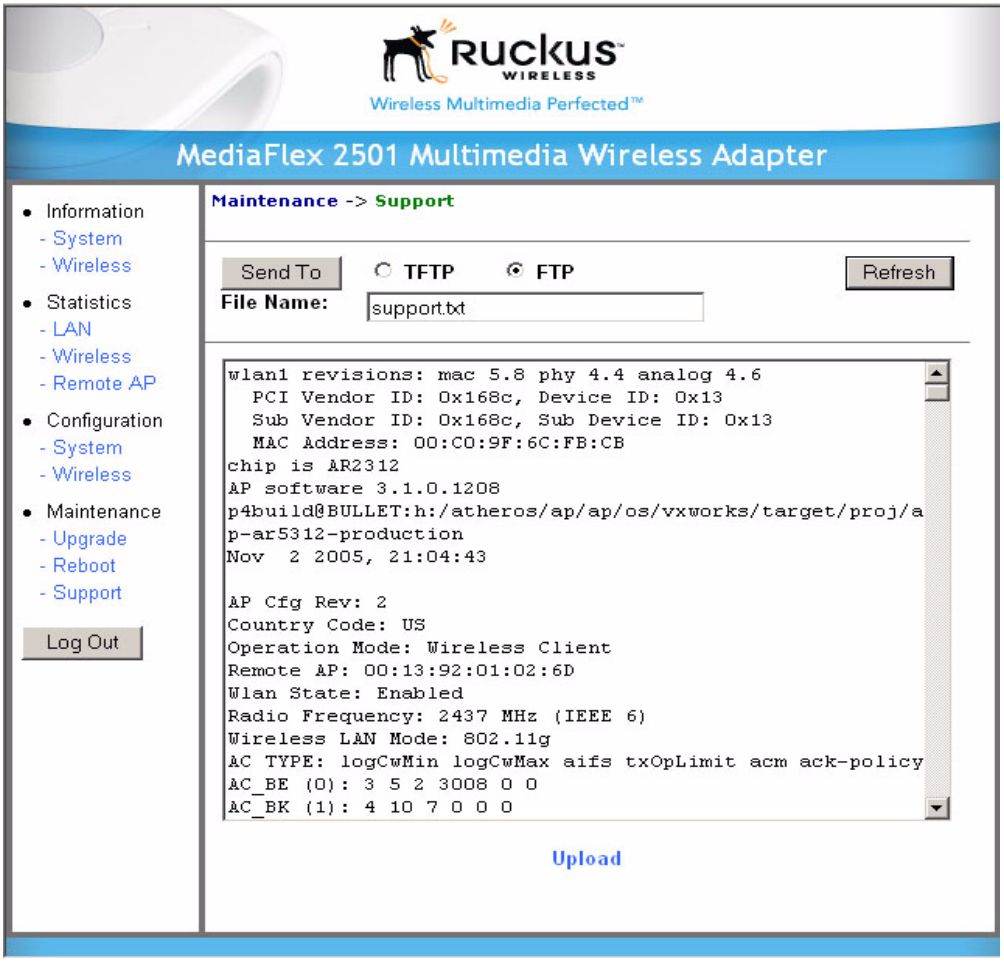

Figure 21—Support Menu

Table 22 describes the support menu parameters.

Table 22—Support Menu

Field	Description
Server Type	Select the server type: TFTP or FTP.
File Name	Specify the file name for the system snapshot that is to be saved on a TFTP or FTP server.

2. If you have not yet configured the TFTP or FTP server, click the **Maintenance->Update** link.
3. In the **Firmware->Update** menu, enter the TFTP or FTP server information. The same server is used for both upgrading the firmware and uploading the system snapshot.

Your service provider or technical support contact should provide you with information for configuring the TFTP or FTP server.

4. Click on the **Refresh** button to get the current system snapshot.
5. Click on the **Send To** button to send the `support.txt` file to the TFTP or FTP server. You can set the address for the TFTP or FTP server in the **Firmware Update** menu.
6. Click the **Upload** link at the bottom of the page to upload to the specified server.

Appendix A: Technical Specifications

Physical Characteristics

Power requirements	**MF2900 AP:** 5V-18V 10W **External power adapter:** Unifive Technology Co LTD, Model US300520, Input 100-240V AC, Output 5V DC 2A, UL Listed DVE, Model DSA-031F-12 UK 12, Input 100-240V AC, Output 12V DC 1A, TUV Certified DVE, Model DSA-031F-12 EU 12, Input 100-240V AC, Output 12V DC 1A, TUV Certified
Physical size	5.72 x 4.92 x 2.9 in (145 x 125 x 74 mm.)
Weight	0.53 lbs (0.24 kg)
Antenna	Internal software-configurable antenna array with six directional, high-gain elements and 63 unique antenna patterns
Ethernet ports	1 auto MDX, auto sensing 10/100 Mbps, RJ45 port
LED display	Antenna Power LAN Wireless Air Quality
Environmental conditions	Operating Temperature: $32^{o}F$ – $104^{o}F$ ($0^{o}C$ – $40^{o}C$) Operating Humidity: 15% - 95% non condensing
Electromagnetic Emissions	Meets requirements of FCC Part 15 Class B

Performance and Supported Configurations

Target UDP throughput	15-20 Mbps sustainable throughout a typical 2500 ft^2 (300 m^2) home

Number of simultaneous video streams	2-3 simultaneous MPEG-4/WMV streams, or 1-2 DVD-quality MPEG-2 streams, or a single 10Mbps+ high definition stream at 50ft (18m) with simultaneous background traffic
Video clients	Video streaming to 802.11b clients not supported

Traffic Management and QoS

Classes of service	Voice, Video, Best Effort and Background
Number of hardware queues	4
Number of software queues	4

Management

Configuration and monitoring interface	Ruckus Wireless Web User Interface (WebUI)
Login	Username: **admin** Password: <*blank*>
Auto configuration	Not available in this release
Statistics	LAN, wireless and associated stations Accessible via Ruckus Wireless Web Interface
Software update	Via FTP, TFTP, or Web download Accessible via Ruckus Wireless Web Interface
Other Utilities	System Support Snapshot
Others	
Standards/Specifications	802.11 b/g 802.11u 802.11e, Wi-Fi Alliance WMM 802.1x
Channels	US/Canada: 1-11 Europe (ETSI X30): 1-13 Japan X41: 1-13
RF Power output	17 dBm for 802.11b 20 dBm for 802.11g
Certifications	FCC, IC-03, CE
Wireless Security	802.1x WEP/WPA Access Control List by station MAC address